Appendix A

Science Action Team Photographs

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PD02-0442-05
Figure A-1. Laying out the trapping design on CFA Landfill I with flagging.

PD02-0442-02
Figure A-1. A Sherman small mammal trap.

PD02-0442-11
Figure A-3. Measuring the body length of a deer mouse captured on CFA Landfill III.

PD02-0442-15
Figure A-4. Marking a small mammal using fingernail polish.

PD02-0442-22
Figure A-5. An active small mammal burrow observed on CFA Landfill III.

Appendix B

Small Mammal Species Captured on CFA Landfills I, II, and III

Appendix B

Small Mammal Species

Deer mouse- Peromyscus maniculatus

Like other small rodents that are heavily preyed upon, the deer mouse is quite secretive. It is primarily active at night when it emerges from its nest to feed on many types of seeds, berries, acorns, fruits, and even insects and other small invertebrates. They line their nest with an accumulation of moss, shredded tree bark, leaves, and other material. Their young can be born from early March on into November with as many as 4 litters a year and 2 to 7 young per litter. Young deer mice grow rapidly and are weaned by the age of 3 weeks and can breed at the age of 5 to 6 weeks. Deer mice rarely live more than a year or two in the wild. They can be found in a variety of forested habitats at various elevations of the southern Appalachian Mountains. Deer mice and other small forest rodents can be extremely numerous. With their reproductive potential, they could easily overpopulate their habitats, but this seldom occurs because of predation.

The deer mouse ranges from around 6 to almost 8 inches in total length including the tail, which is about half of its total length. Adult deer mice are generally colored a tan or brown above with a white underbelly and throat while young deer mice are colored gray above with white underparts. The ears are large, rounded and mostly hairless and the eyes are large and bulging. In overall appearance, the deer mouse at first glance looks almost identical to the White-footed mouse with which it may share the same general habitats. They can generally be told apart by looking at the tail. The tail of a deer mouse is bicolored, the top half being slightly darker than below (WNC Nature Center 2002).

Great Basin Pocket Mouse- *Perognathus parvus*

The Great Basin pocket mouse is slightly larger than the "little pocket mouse." Its dorsal surface is a yellowish color with an occasional pinkish tone. The tail is bicolored with a dark upper side and whitish underside with a tuft of hair at the tip. The Great Basin pocket mouse hibernates during the months October through March. These little mammals are nocturnal and begin their nightly activities around sunset. The Great Basin pocket mouse is a fairly solitary mammal whose home range has been estimated at up to 1 acre. Main predators include snakes, hawks, owls, weasels, badgers, and other carnivores.

These animals are mostly found in arid, sandy, short-grass steppes, shrub steppe, and pinyon/juniper woodland. They like light-textured, deep soils. However, in Idaho they are primarily found in areas with sagebrush, rabbitbrush, bitterbrush, as well as grassy fields (Streubel 2000a).

Least Chipmunk - *Eutamias Minimus*

Least chipmunks vary in color from a yellowish brown-gray with tan stripes to a dark brown with black stripes, which continue down to the tip of the tail. The sides are generally a reddish brown. Their total length is about 7 to 8.5 cm (2.8 to 3.3 in.). One distinguishing trait this species has is the vertical position it hold its tail in when moving.

Living quarters of the least chipmunks are generally found underground. Here, a chamber contains a nest and a store of seeds for the winter. Individuals may actually burrow out from hibernation through late-lying snow in the spring. Breeding peaks by April. Females produce one litter per year of 5-6 young. By mid-June, young chipmunks are seen outside the burrow. In two months, they are nearly full grown and independent.

Favorite foods of the least chipmunk include wild berries and seeds. Cactus fruit is eaten when available. Insects are also frequently preyed upon, especially beetles, grasshoppers, and caterpillars. In Idaho, least chipmunks are usually found in sagebrush, juniper, and lower-elevation coniferous forests near or adjacent to sagebrush areas in an edge effect (USGS 2002a).

PD02-443-07
Montane Vole - *Microtus Montanus*

Montane Voles are about the same size as a meadow vole with brownish to grayish-brown buff color on their top. The underside is a silvery gray. Their body length ranges from 13 to 19 cm (5.3 to 7.6 in.). Its tail is about (3.6 to 5.8 cm (1.4 to 2.3 in.) and its weight is about 34 g (1.2 oz).

These ground and underground foragers eat mainly succulent stems and leaves of grasses, sedges, rushes, and forbs. They make runways when living in grasslands. During winter, they make tunnels beneath the snow in order to forage. Breeding season usually occurs from March to November, although green vegetation is known to stimulate reproduction. Voles excavate a new nest for every litter (1-5 per year) unless they are at high densities. At high population levels, they will use the same nest for two consecutive litters. Nests consist of dried grasses within a burrow of moist soil. Mated pairs don't share the nest. Once impregnated, the gestation period of a female vole lasts 21 days. The litter sizes average 5-6 young and are weaned at 3 weeks.

The Montane vole prefers slightly drier area climates. Typically in Idaho they are found in moist, mountain meadows and high valleys, but also in shrub steppe (especially crested wheatgrass). They live in runaway burrows and dense grasses (Streubel 2000b).

Ord's Kangaroo rat - *Dipodomys Ordii*

The Ord's kangaroo rat is usually found in sandy soils. Its hind 5-toed feet distinguish this rat. It has also has a very distinct spot under its eyes and at the base of its neck. The underbelly is a pale cinnamon color intermixed with blackish fur. It can also be a more orange-brown color. The tail has a dark stripe on top and bottom and a white one on the sides.

Ord's kangaroo rats are unique in the animal world because nature has provided them with the ability to survive with very little water and, in the deserts, with no free water at all. They do not store water in their bodies for future use like other animals, yet experiments have shown that their bodies have about the same water content as other animals. In fact, they have the ability to convert the dry seeds they eat into water, and they neither sweat nor pant like other animals to keep cool. They also have specialized kidneys, which allow them to dispose of waste materials with very little output of water. In addition, they spend their days in their burrows where the air is moist and humid. Consequently, they can survive and be quite comfortable. No matter how hot and dry it is outside their dens, Kangaroo Rats come out only at night when it is cool and when there is a minimum of evaporation.

Ord's kangaroo rats are solitary animals with a home range of less than one-half acre; the female's home territory is usually smaller than the males. They live in burrows they dig themselves. The burrows go into the ground at an angle, are 3.8 to 7.6 cm (1.5 to 3 in.) in diameter and shaped like an inverted U, though flat on the bottom.

The kangaroo rats primary food is seeds -- some eat grasses, succulents, other green vegetation and insects. Most kangaroo rats gather seeds when they are available and store them for consumption later. The small storage holds only the contents of two cheek pouches.

Some species have 2 to 3 litters a year with 1 to 7 offspring, but usually 2 in a litter. At birth, young are toothless, hairless, wrinkled, eyes and ears are closed, and they show the color pattern of adults in shades of pink. Young males grow faster in terms of mass than young females.

Kangaroo rats like open, bare sandy areas, usually in grassland. In Idaho, they are primarily found in areas with sagebrush, shadscale, created wheatgrass, kochia, greasewood, and halogeton. Their burrows are generally easy to see (Desert USA 2002).

Richardson's Ground Squirrel - *Spermophilus richardsonii*

Richardson's ground squirrels are only active during daylight hours and dig their meandering burrows about 8.9 cm (3.5 in.) in diameter, 4.6 to 6.1 m (15 to 20 ft) in length, and 1.2 to 1.5 m (4to 5 ft) below the surface. Each burrow has a mound of excavated dirt at the entrance where the animal can often be seen standing. The burrow leads to a spherical nesting chamber lined with grasses and straw. These ground squirrels are colonial and often burrows are only a few feet apart. Densities of up to 20 squirrels per acre are common in favorable habitat.

Like other ground squirrels, the Richardson appears above ground in the warm days of spring after hibernation. Breeding takes place within a few days after the female emerges. Young are born underground in late April to early May. By late May or early June, the 6-8 young come out of the burrow and begin to forage. Not more than one-fourth of juvenile females and males survive to see the next year. Adults rarely live more than three or four years.

A high death rate for the Richardson's ground squirrel is contributed to a variety of factors. Many are eaten by predators during the period when young disperse to find new territories. However, this ground squirrel has many enemies even after it is established in a colony. Badgers excavate many burrows to find a meal, weasels and snakes are small enough to actually crawl into the burrow, and birds such as the eagles, hawks, and falcons take them unexpectedly from above.

The cheek pouches of this ground squirrel often contribute to its head looking larger in comparison to its body. Seeds and available fruits are gathered in early spring and late summer to be eaten, but are also stored for later use. When the plants of late spring emerge, they become the primary food source. The Richardson will also eat remains of dead animals (USGS 2002b).

Townsend's Ground Squirrel - *Spermophilus townsendii*

This rather small ground squirrel is quite plain looking, appearing dappled gray above with an underside of white buff. They have a rather short tail. the tail face, hindquarters and underside have a reddish tint to them. They weigh between 128 and 325 g (4.5 and 11.5 oz).

The Townsend's ground squirrel likes well-drained soil and shrub steppe, sagebrush, shadscale, or greasewood. Mainly herbivorous; this ground squirrel eats green leaves, plant stems, flowers, roots, bulbs, seeds, unripe grain, insects, and carrion, and frequently is cannibalistic. It forages on the ground surface and digs for food, uses the cover of shrubs to avoid predators and heat, and digs escape burrows at the base of shrubs. Burrows of the Townsend's ground squirrel may extend from cover to feeding areas.

A nest of grass, sagebrush, and other materials is located in the burrow system, which may be up to 15 m (50 ft) long and 1.8 m (6 ft) deep. The Townsend's ground squirrel may not require free water for drinking. It obtains water from green plants, aestivating when plants are dry.

Active in the spring and early summer, from January to June or July. Summer aestivation begins when plants are no longer green. Townsend's ground squirrel is diurnal, with activity peaks in the morning and late afternoon. Density may reach 76/ha (30/acre), and may vary cyclically. These squirrels live in large colonies. Mating occurs soon after activity begins (January through March). Gestation period is 23 or more, days; the young are born in February through April. Average litter sizes reported include 9 (range 4-16) and 4.8. One litter is produced per year. The young are weaned in 35 days and reproduce as yearlings (Johnson 2002).

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